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INTERNSHIP PROPOSAL

Academic Year 2023-2024

Job title: Data scientist (W/M)

Business unit: SUEZ Air & Climate Solutions France (Nanterre)

Project title: Development of an atmospheric surrogate model for air quality monitoring at industrial sites

Keywords: data science, data scientist, data analysis, environmental engineering, digital product, air quality

Project description

SUEZ Air & Climate Solutions has a rich history in the domain of air pollution monitoring, treatment, and modeling. Within SUEZ Air & Climate Solutions, the Vision360 team focuses on translating state-of-the-art science into an easy-to-use, integrated, and interoperable platform at scale. We are setting up a portfolio of digital products to make air surveillance accessible to all. In a first step, our customers are industrial sites that want to manage the impact of their operations on the surrounding air. We deliver a digital platform which allows them to monitor, understand and predict air conditions at their sites. More precisely, we leverage on-site sensor measurements in combination with state-of-the-art meteorological and physical modeling. We assimilate this data to present it to our users in a way that makes it easy for them to understand what potential challenges on their operations are and how we can further help thanks to other solutions in our portfolio.

One important challenge is the computing resources needed for physical models to run. The use of these resources has an impact both on the cloud costs associated with the solution that we provide to our clients, and on the greenhouse gas emissions associated with the energy required to power the cloud computing centers. **The objective of the internship project is therefore to propose, implement and evaluate a model for estimating the impact of an industrial operation on the surrounding air that is less resource intensive than the existing physically-based modeling approach, keeping a satisfactory level of uncertainties in line with users' expectations.** This surrogate model will learn from results from the deterministic model depending on different conditions in which this model is run. It will then propose a predictive algorithm to estimate deterministic model outputs, using a data-driven approach, leveraging machine learning models such as neural networks. The expected outcome of the internship is to deliver a scientifically robust approach that will then be integrated into the product portfolio to deliver air pollution maps operationally, at a lower cost and with smaller environmental impact than current approaches.

During the internship, the student will start with **learning** about the business use case, **analyzing** the data, and **identifying** algorithmic approaches to solve the problem via a literature review. The student will summarize and present the proposed approaches to product and science leads. The student will then **design**, **implement**, and **iterate** over the solution. The student will be managed by a product leader, and **collaborate** with air quality experts,

deterministic model experts and machine learning experts, and will **bridge** between these disciplines to propose a solution. Throughout the internship, he will **communicate** his findings to an interdisciplinary audience and **integrate** their feedback to improve the proposed solution.

We are looking for candidates with:

- Hands-on experience with programing and data analysis in Python
- Solid theoretical background in data analysis and machine learning
- Knowledge of environmental sciences, in particular atmospheric physics, and numerical modeling for environmental applications is a plus
- Strong technical problem solving, literature searching, and collaboration skills

Compensation: Yes, depending on the candidates' background and experience

Duration: 6 months preferred

Interested? To have a further discussion or to apply, you can contact me at karina.cucchi@suez.com. Please include in your email your CV (or a link to your profile on Linked In), as well as a short description (1/2 page) of why you are interested in the position.